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10/580,678	01/25/2007	Marcel Bouffier	12928/10030	5728
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Davidson, Davidson & Kappel, LLC			EXAMINER	
485 7th Avenue			PALABRICA, RICARDO J	
14th Floor				
New York, NY 10018				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,678

Applicant(s)

BOUFFIER, MARCEL

Examiner

Rick Palabrica

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/22)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

1. Applicant's 2/1/10 Amendment, which traversed the rejection of claims based on applied art, Hesketh, is acknowledged.

Response to Arguments

2 Applicant argues that: a) "[i]n Hesketh, only fuel rods containing plutonium are shown in Fig. 4, which is used to reject claims 12 and 22"; and b) "while MOX assemblies are often zoned, no prior art, including Hesketh, teaches or shows zoning UO₂ assemblies as claimed.

The examiner disagrees.

As to argument a):

First, Hesketh teaches that his core can include uranium dioxide fuel assemblies, as stated in section 2 of the 11/3/09 Office action.

Second, Fig. 4 in Hesketh, which refers to mixed oxide fuel, is the preferred form of his invention (see page 4, last paragraph). The uranium dioxide fuel, which Hesketh himself admits as suitable for his core, can be a non-preferred form of the invention.

Note in this regard:

MPEP 2123 Rejection Over Prior Art's Broad Disclosure Instead of Preferred Embodiments

I. PATENTS ARE RELEVANT AS PRIOR ART FOR ALL THEY CONTAIN

A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989). See also *Celeritas Technologies Ltd. v. Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998) (The court held that the prior art

anticipated the claims even though it taught away from the claimed invention. "The fact that a modem with a single carrier data signal is shown to be less than optimal does not vitiate the fact that it is disclosed.").

II. NONPREFERRED AND ALTERNATIVE EMBODIMENTS CONSTITUTE PRIOR ART

Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "[t]he prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed.." *In re Fulton*, 391 F.3d 1195, 1201, 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

As to argument b), in addition to the applied art in the 11/3/09 Office action, the previously applied references teach the claimed zoning of UO₂ assemblies, as further demonstrated in sections 6 and 7 below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 12-15, and 21-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Hesketh et al. (WO 01/50477) who disclose a fuel assembly for a pressurized water nuclear reactor (e.g., see Figs. 1-4).

The reasons are the same as those stated in section 2 of the 11/3/09 Office action, as further clarified in section 2 above, which reasons are herein incorporated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12-15 and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hesketh et al. either alone or in view of either one of Millot (U.S. 4,652,416) or Ferrari et al. (U.S. 4,326,922).

The reasons are the same as those stated in section 3 of the 11/3/09 Office action, as further clarified in section 2 above, which reasons are herein incorporated.

5. Claims 16-20 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hesketh et al. either alone or in view of Delafosse (U.S. 4,224,106).

The reasons are the same as those stated in section 3 of the 11/3/09 Office action, as further clarified in section 2 above, which reasons are herein incorporated.

Examiner's note: The following sections are provided as evidence to demonstrate that applicant's allegation in the 2/1/10 Amendment, i.e., "no prior art teaches or shows zoning UO₂ assemblies as claimed", is incorrect.

6. Claims 12-15 and 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 196 655 (applied in the 11/4/08 Office action) in view of

Hesketh et al. (applied in the 11/3/09 Office action) alone or further in view of Anthony et al. (U.S. 3,366,546). EP 0 196 655 disclosed the applicant's claim limitations except for the third group of fuel rods.

As to claims 12 and 21, applicant's claim language reads on the EP 0 196 655 PWR fuel assembly as follows (e.g., see Fig. 6, and paragraph bridging pages 29 and 30): a) "first central group" reads on the group of large diameter fuel rods; b) "second group of fuel rods" reads on the group of small diameter fuel rods that have less nuclear reactivity than the first central group of rods. The reference discloses that the fuel for the fuel assembly can be slightly enriched uranium dioxide only (see page 13, lines 24+).

As to claim 21, EP 0 196 655 has a fuel rod network with a square outer contour.

As to claim 22, it is inherent that when the above EP 0 196 655 fuel assembly is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating power level.

Hesketh et al. teach a PWR fuel assembly can be formed of two, three or four different diameters of fuel rods, or even higher numbers of fuel rod diameters (see page 1, last paragraph). They further teach an assembly of three different diameter rods, wherein the fuel rods positioned at the corner of the assembly have smaller diameter than the intermediate rods positioned at the non-corner periphery to prevent power peaking problems (see page 8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by EP 0 196

655, by the teaching in Hesketh et al., to use corner rods of smaller diameter than the non-corner peripheral rods, to gain a further advantage (i.e., avoid power peaking problems), because such modification is no more than the use of a well known expedient within the nuclear art.

It is a notorious scientific fact that corner rods in a PWR fuel assembly are subject to peak neutron flux. If applicant needs a teaching on this truism, he can refer to Anthony et al. (see col. 6, lines 73+).

As to claims 13 and 23, the examiner interprets "neutron contaminant" as neutron poison or neutron absorber. The fuel rods in either EP 0 196 655 or Hesketh et al. inherently include neutron poison/absorber, e.g., non-uranium elements or impurities in the fuel material, or fission products that are inherently produced when the rods are used during operation of the nuclear reactor.

As to claim 14, the second group in the above combination extends, for each of the faces of the outer contour of the network of rods, and the third group comprises only the fuel rods at the corners of the outer contour.

As to claim 15, the above combination meets the claim limitation because the masses of uranium 235 in the three groups of rods are different because of the diameter of rods in one group is different from the diameter of rods in another group.

As to claim 21, the fuel rod network in the above combination has a square outer contour (see Fig. 6 in EP 0 196 655).

As to claims 24 and 25, see Fig. 6 in EP 0 196 655 and Fig. 1 in Hesketh et al.

As to claim 26, see page 2, 6th paragraph in Hesketh et al.

As to claims 27 and 28, see page 2, last paragraph in Hesketh et al.

The claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, "for a pressurized water reactor," "for receiving rods of a control rod cluster", etc. These clauses, as well as other statements of intended use do not serve to patently distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531.

[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525,1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The system in the cited reference is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited reference.

7. Claims 16-20 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 196 655 (applied in the 11/4/08 Office action) in view of Hesketh et al. (applied in the 11/3/09 Office action) alone or further in view of Anthony et al. (U.S.

3,366,546), and, where necessary, further in view of Delafosse (applied in the 11/3/09 Office action).

As to claims 16 and 17, it is a notorious scientific fact that the reactivity of a fuel rod can be set either by the amount (or mass) of uranium 235 or the enrichment of uranium 235. Therefore, whether the reactivity is obtained by different masses or different enrichment of uranium 235 is either a design choice or a constraint imposed by the utility-operator of the reactor. If applicant disagrees, then Delafosse, who teaches that mass of uranium is related to enrichment, confirms the examiner's statement (see col. 3, lines 6+ in Delafosse).

As to claims 18-20, the specific levels of enrichment of the groups of fuel rods are matters of design and/or optimization. The enrichment depends upon constraints that include the required power level, burn-up, and fuel management scheme that the utility adopts for the reactor. Additionally, the selected enrichment levels have to be optimized in order for the reactor to generate the maximum energy output at the lowest possible cost.

See MPEP 2144.05 II.A as to matters of optimization within prior art conditions or through routine experimentation.

Note also that MPEP 2144.05.II (Optimization) requires that a particular parameter be recognized as a result-effective variable, i.e., a variable which achieves a recognized result. The enrichment of fuel rods in an assembly is clearly a result effective variable, which achieves varying degrees of benefits. Different enrichments for

these fuel rods will affect, e.g., fuel burnup and shutdown margin, but are largely predictably.

As to claim 29, a 15x15 configuration, which is intermediate to the well known 14x14 and 17x17 configurations, is another notorious PWR fuel assembly configuration.

Therefore, it would have been intuitively obvious to one having ordinary skill in the art at the time the invention was made to apply the embodiment of Fig. 4 to the intermediate 15x15 configuration to gain the advantages of said embodiment, i.e., improved reactor performance and/or burnup rate and/or ease of manufacture (see Abstract of Hesketh).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rick Palabrica/

Primary Examiner, Art Unit 3663

February 13, 2010